What is claimed is:

1. An elongate bat having a longitudinal axis and an overall first length comprising

an elongate tubular striking member shorter than said first length having a distal end, a proximal end, a striking region intermediate said distal and proximal ends, and a juncture section adjacent said proximal end converging toward said axis on progressing toward said proximal end, said striking member having a first effective mass, and

an elongate handle member shorter than said first length composed of a material having a second effective mass which is different from said first effective mass, said handle member having a distal end and a proximal end and being firmly joined adjacent its distal end to the proximal end of said striking member to provide a rigid interconnection therebetween to permit substantially complete striking energy transfer between said handle member and said striking member.

2. The bat of claim 1, wherein the effective mass of the handle member is less than the effective mass of the striking member.

3. The bat of claim 1, wherein said juncture section has a length no greater than 25% of said first length.

4. The bat of claim 1, wherein said handle member has a juncture section adjacent its distal end which diverges from said axis on progressing toward said distal end, with a configuration substantially complementary to the converging portion of the juncture section of the striking member, and portions of said juncture sections of said handle member and striking member rest in mating contact.

5. The bat of claim 4, wherein said juncture sections of said striking member and handle member are substantially frusto-conical, each having a major diameter section and a minor diameter portion, with the major diameter portion of the juncture section of the handle member being greater than a minor diameter portion of the juncture section of the striking member.

6. The bat of claim 5, wherein said striking region of said striking member has a first diameter, said handle member has a gripping portion positioned toward its proximal end from its juncture section, the gripping portion having a second diameter which is less than said first diameter, with said juncture section of said handle member captured in said juncture section of said striking member.

7. The bat of claim 5, which further comprises adhesive material interposed between said juncture sections whereby said juncture sections are adhesively joined.

8. The bat of claim 5, wherein at least one of an outer surface of the juncture section of the handle member and an inner surface of the junction section of the striking member has a plurality of projections which extend radially a predetermined distance.

9. The bat of claim 8, wherein the predetermined distance is in a range of 0.001 to 0.010 inches.

10. The bat of claim 8, wherein the outer surface of the juncture section of the handle member, the inner surface of the juncture section of the striking member and the projections define at least one space, and wherein an adhesive at least partially fills the at least one space to join the handle and striking members.

11. The bat of claim 8, wherein the predetermined distance is equal to the thickness of a desired layer of an adhesive for joining the handle and striking members.

12. The bat of claim 8, wherein the predetermined distance is in a range of 0.002 to 0.005 inches.

13. The bat of claim 8, wherein a projection has a width in a range of 0.125 to 0.75 inch.

14. The bat of claim 8, wherein a projection has a width in a range of 0.2 to 0.3 inch.

15. The bat of claim 8, wherein said projections comprise elongate ribs extending substantially longitudinally of said bat.

16. The bat of claim 8, wherein said projections are helical.

17. The bat of claim 8, wherein said projections are on said handle member and outer surfaces of said projections firmly contact the inner surface of said juncture section of the striking member.

18. The bat of claim 1, wherein the striking member is formed from a material selected from the group consisting of a metal, wood, a fiber composite material, and a non-metallic material.

19. The bat of claim 1, wherein the striking member is composed of metal having a first specific gravity and the handle member is composed of composite material having a second specific gravity which is different from said first specific gravity.

20. The bat of claim 19, wherein the specific gravity of the handle member is less than the specific gravity of the striking member.

21. The bat of claim 1, wherein the handle member is formed from a material selected from the group consisting of a metal, wood, a fiber composite material, and a non-metallic material.

22. The bat of claim 21, wherein said composite comprises a fiber composite material.

23. The bat of claim 22, wherein said fiber composite material comprises carbon fibers in an epoxy matrix.

24. The bat of claim 22, wherein the fiber composite material comprises a chopped fiber slurry.

25. The bat of claim 1, wherein the handle member is formed of a fiber composite material comprising a plurality of tubular layers, wherein each layer comprises a matrix including structural fibers supported by the matrix, and wherein the plurality of tubular layers includes fiber layer configurations selected from the group consisting of a layer of longitudinally extending fibers, a layer of circumferentially extending fibers, a layer of helically extending fibers, a layer of braided fibers, and combinations thereof.

26. The bat of claim 1, wherein the striking member is formed of a fiber composite material comprising a plurality of tubular layers, wherein each layer comprises a matrix including structural fibers supported by the matrix, and wherein the plurality of tubular layers includes fiber layer configurations selected from the group consisting of a layer of longitudinally extending fibers, a layer of circumferentially extending fibers, a layer of helically extending fibers, a layer of braided fibers, and combinations thereof.

27. The bat of claim 1, further comprising a weighted plug coupled to the proximal end of the handle member.

28. The bat of claim 27 wherein the weighted plug weighs in the range of 0.5 to 7 ounces.

29. The bat of claim 27 wherein the weighted plug weighs in the range of 2 to 5 ounces.

30. The bat of claim 27 wherein the weighed plug has a length in the range of 1.0 to 4.0 inches.

31. The bat of claim 1, which further comprises a second tubular member concentric with the striking region of the striking member.

32. The bat of claim 31, wherein said striking member has a hollow circular cross section and said second tubular member comprises an insert having a circular cross section positioned within the striking region of said striking member.

33. The bat of claim 32, wherein said distal end of said handle section is received in the juncture section of said striking member and the second tubular member has an end facing said handle section which is spaced a distance from said handle section.

34. A bat comprising an elongate tubular striking member having a distal end, a proximal end, and a juncture section adjacent said proximal end, and an elongate tubular handle member of a composite material having a distal end, a proximal end, and a juncture section adjacent said distal end of the handle member, said juncture sections of said handle member and striking member being positioned contiguous each other and firmly joined to provide a rigid interconnection therebetween to permit substantially complete striking energy transfer between said handle member and said striking member.

35. The bat of claim 34, which has a longitudinal axis, said juncture section of the striking member converges toward said axis on progressing toward said proximal end of said striking member, and said handle member juncture section diverges from said axis on progressing toward said distal end, with said handle member juncture section having a configuration substantially complementary to the converging portion of the juncture section of the striking member and said juncture sections of said handle member and striking member rest in mating contact.

36. The bat of claim 35, wherein said juncture sections of said striking member and handle member are substantially frusto-conical, each having a major diameter section and a minor diameter portion, with the major diameter portion of the

juncture section of the handle member being greater than a minor diameter portion of the juncture section of the striking member.

37. The bat of claim 34, wherein said striking member has a striking region of a first diameter, said handle member has a gripping portion positioned toward its proximal end from its juncture section, the gripping portion having a second diameter which is less than said first diameter, and said handle member extends through the proximal end of said striking member with said juncture section of said handle member captured in said juncture section of said striking member.

38. The bat of claim 34, wherein an outer surface of said juncture section of the handle member is disposed within the confines of an inner surface of the juncture section of the striking member and adhesive material is disposed between said inner and outer surfaces to join said handle and striking members.

39. The bat of claim 34, wherein at least one of an outer surface of the juncture section of the handle member and an inner surface of the junction section of the striking member has a plurality of projections which extend radially a predetermined distance.

40. The bat of claim 39, wherein the predetermined distance is in a range of 0.001 to 0.010 inches.

41. The bat of claim 39, wherein the predetermined distance is in a range of 0.002 to 0.005 inches.

42. The bat of claim 34, wherein the outer surface of the juncture section of the handle member, the inner surface of the juncture section of the striking member and the projections define at least one space, and wherein an adhesive at least partially fills the at least one space to join the handle and striking members.

43. The bat of claim 39, wherein the predetermined distance is equal to the thickness of a desired layer of an adhesive for joining the handle and striking members.

44. The bat of claim 34, wherein said composite comprises a fiber composite material.

45. The bat of claim 34, wherein the striking member is formed from a material selected from the group consisting of a metal, wood, a fiber composite material, and a non-metallic material.

46. The bat of claim 44, wherein the fiber composite material comprises a chopped fiber slurry.

47. The bat of claim 34, wherein the handle member is formed of a fiber composite material comprising a plurality of tubular layers, wherein each layer comprises a matrix including structural fibers supported by the matrix, and wherein the plurality of tubular layers includes fiber layer configurations selected from the group consisting of a layer of longitudinally extending fibers, a layer of circumferentially extending fibers, a layer of helically extending fibers, a layer of braided fibers, and combinations thereof.

48. The bat of claim 34, wherein the handle member comprises plural tubular layers, each layer comprising a matrix and structural fibers supported by the matrix, with at least one of the layers comprising fibers that extend substantially circumferentially and multiple layers comprising fibers that extend substantially longitudinally, wherein the number of longitudinal layers is greater than the number of circumferential layers.

49. A bat comprising an elongate tubular striking member having a distal end, a proximal end, and a juncture section adjacent said proximal end, and an elongate tubular handle member having a distal end, a proximal end, and a juncture section adjacent said distal end of the handle member, said juncture sections of said handle member and striking member being positioned contiguous each other and firmly joined together to provide a rigid interconnection therebetween to permit substantially complete striking energy transfer between said handle member and said striking member, said striking member comprising material formed to have appropriate strength in a given direction to successfully withstand the impact of a batted object and said handle member comprising material formed with appropriate configuration to produce selected resistance to bending along its longitudinal axis to produce desired bat swing characteristics.

50. The bat of claim 49, wherein the handle member comprises plural layers of fiber composite material, each layer comprising a matrix and structural fiber supported by the matrix, with the majority of the fibers extending at an angle less than about 50° relative to the longitudinal axis of the handle member layers.

51. The bat of claim 49, wherein the striking member is formed of metal and the handle member is formed of composite material.

52. The bat of claim 49, wherein the handle member comprises plural layers of fiber composite material, with selected layers extending the full length of the handle member, and other layers extending over only a selected portion of the length of the handle member less than its full length.

53. The bat of claim 52, wherein said selected layers less than the full length of the handle member are placed at different positions along the length of the handle member.

54. The bat of claim 52, wherein selected layers are formed in a variety of shapes and are laid up in selected positions along the length of the handle member to produce selected strength and stiffness characteristics for the handle member.

55. The bat of claim 52, wherein the handle member comprises plural layers of fiber composite material, with selected ones of the layers being composed of fiber material different from fiber material in others of the selected layers.

56. The bat of claim 55, wherein the selected layers are composed of fibers chosen from a group including carbon fibers, boron, fiberglass, or metals.

57. The bat of claim 49, which further comprises a weighted element secured to the proximal end of said handle member.

58. A method for constructing an elongate bat having a longitudinal axis comprising the steps of

forming an elongate tubular striking member having a circular cross section with a proximal end, a distal end, a striking region therebetween, and a juncture section adjacent said proximal end converging toward said axis on progressing toward said proximal end to form a mouth of a first diameter,

forming an elongate handle member of composite material having a circular cross section having a proximal end, distal end and juncture section adjacent said distal end which diverges from said axis on progressing toward said distal end to a second diameter greater than said first diameter,

assembling the striking member and handle member by inserting the handle member into the striking member with at least a portion of the outer surface of the juncture section of the handle member engaging a portion of the inner surface of the juncture section of the striking member, and remainder portions of said handle member extending longitudinally from said proximal end of the striking member, and

joining the juncture section of the handle member to the juncture section of the striking member to provide a rigid interconnection between the striking member and the handle member.

59. The method of claim 58, wherein in said joining step adhesive is applied between said juncture sections and cured.

60. The method of claim 58, wherein said striking member is formed of a material having a first specific gravity and said handle member is formed of a composite material having a second specific gravity different from said first specific gravity.

61. The method of claim 58, wherein the diverging portion of the juncture section of the handle member is formed in a configuration complementary to the converging portion of the juncture section of the striking member.

62. The method of claim 58, wherein the step of forming the handle member comprises positioning plural composite layers adjacent each other to form a tubular member, and curing said layers.

63. The method of claim 62, wherein the step of forming the handle member comprises the steps of positioning plural composite layers containing structural fibers therein adjacent each other such that each layer is tubular, and orienting the layers such that the majority of the layers have fibers extending at an angle less than about 50° relative to the longitudinal axis of the handle member.

64. The method of claim 62, wherein at least one molding member is impressed against the outside of said tubular member during forming to produce spaced apart projections on said juncture section of the handle member, with said projections extending outwardly from remainder portions of said tubular member.

65. The method of claim 64, wherein said molding member is removed following curing.

66. The method of claim 64, wherein said projections are formed as elongate ribs extending substantially longitudinally of said handle member.

67. The method of claim 64, wherein said ribs are positioned to engage the inner surface of said juncture section of the striking member when assembled.

68. The method of claim 64, wherein said molding member produces projections in a range of 0.002 to 0.005 inch in height.

69. A method for constructing an elongate bat having a longitudinal axis comprising the steps of

forming an elongate tubular striking member having a circular cross section with a proximal end, a distal end, a striking region therebetween and a juncture section adjacent said proximal end,

forming an elongate handle member of composite material having a circular cross section having a proximal end, distal end and juncture section adjacent said distal end, wherein the step of forming the handle member comprises positioning plural composite layers adjacent each other to form a tubular member and curing said layers,

assembling the striking member and handle member with at least a portion of the outer surface of the juncture section of the handle member engaging a portion of the inner surface of the juncture section of the striking member, and

joining the juncture section of the handle member to the juncture section of the striking member to provide a rigid interconnection therebetween.

70. The method of claim 69, wherein in the step of forming the handle member, selected numbers and orientation of composite layers are applied.

71. The method of claim 70 wherein the handle member has a selected overall length, selected ones of said composite layers have a length substantially equal to said overall length, and others of said composite layers have a length shorter than said overall length.

72. The method of claim 71 wherein composite layers which are shorter than said overall length are positioned at varying positions intermediate the proximal and distal ends of said handle member.

73. The method of claim 70 wherein the composite layers each comprise a matrix including structural fibers supported by the matrix, and wherein the layers are selected from a group of fiber layer configurations consisting of a layer of longitudinally extending fibers, a layer of circumferentially extending fibers, a layer of helically extending fibers, a layer of braided fibers, and combinations thereof.

74. A bat for striking a ball, the bat comprising:

an elongate tubular striking member extending along a longitudinal axis and having a distal end, a proximal end, and a first juncture section adjacent the proximal end of the striking member, the striking member being formed of a first material; and

an elongate tubular handle member extending along the longitudinal axis and having a distal end, a proximal end and a second juncture section adjacent the distal end of the handle member, the handle member coupled to the striking member such that at least a portion of the first juncture section firmly and directly contacts at least a portion of the second juncture section, the handle member having a resistance to bending along the longitudinal axis in the range of 200-1980 lbs/in a three-point bend stiffness test wherein the handle member is transversely supported in a first direction by a pair of supports spaced apart a selected distance, with a first support adjacent the distal end and a second support adjacent the proximal end, and is transversely loaded in a second direction, opposite the first direction, at a location on the handle member in a region between 30% and 40% of said selected distance from the distal end of the handle member.

75. The bat of claim 74 wherein the handle member has a resistance to bending along the longitudinal axis in the range of 400-900 lbs/in.

76. The bat of claim 74 wherein the handle member has a length in the range of 9 to 22 inches, and wherein the handle member has a weight in the range of 3 to 8 ounces.

77. The bat of claim 76, wherein the handle member has a weight in the range of 5 to 7 ounces.

78. The bat of claim 74, wherein the striking member is formed from a material selected from the group consisting of a metal, wood, a ceramic, and a fiber composite material.

79. The bat of claim 74, wherein the handle member is formed of a fiber composite material comprising a plurality of tubular layers, wherein each layer comprises a matrix including structural fibers supported by the matrix, and wherein the plurality of tubular layers includes fiber layer configurations selected from the group consisting a layer of longitudinally extending fibers, a layer of circumferentially extending fibers, a layer of helically extending fibers, a layer of braided fibers, and combinations thereof.

80. The bat of claim 79 wherein the helically extending fibers of the at least one layer of helically extending fibers extend along the handle member at an angle that is between +/– 1 to 89 degrees from the longitudinal axis.

81. The bat of claim 79 wherein the handle member includes a proximal gripping portion and a distal tapered portion, wherein one of the proximal gripping portion and the distal tapered portion is formed with a larger number of layers than the remaining portion.

82. The bat of claim 74, wherein the composite material of the handle member comprises a chopped fiber slurry.

83. The bat of claim 74, further comprising a weighted plug coupled to the distal end of the handle member.

84. The bat of claim 83 wherein the weighted plug weighs in the range of 2 to 5 ounces.

85. The bat of claim 83 wherein the weighted plug has a length in the range of 1.0 to 4.0 inches.

86. The bat of claim 79 wherein the fibers are formed of a material selected from the group consisting of glass, fiberglass, carbon, boron, metal and combinations thereof.

87. The bat of claim 79 wherein the fibers have an area fiber density within the range of 0.0143 and 0.048 grams/cm^2.

88. The bat of claim 74, wherein the first material has a greater impact resistance to ball strikes than the composite material of the handle member.

89. The bat of claim 74, wherein at least one of an outer surface of the juncture section of the handle member and an inner surface of the junction section of the striking member has a plurality of projections which extend radially a predetermined distance.

90. A bat for striking a ball, the bat comprising:

an elongate tubular striking member extending along a longitudinal axis and having a distal end, a proximal end, and a first juncture section adjacent the proximal end of the striking member, the striking member being formed of a first material; and

an elongate tubular handle member extending along the longitudinal axis and having a distal end, a proximal end and a second juncture section adjacent the distal end of the handle member, the handle member coupled to the striking member such that at least a portion of the first juncture section firmly and directly contacts at least a portion of the second juncture section;

the bat having a resistance to bending along the longitudinal axis in the range of 500 to 2500 lbs/in a three-point bend stiffness test wherein the bat is transversely supported in a first direction at a first location 6 inches from the distal end of the striking member and at a second location 6 inches from the proximal end of the handle member, and is transversely loaded in a second direction, opposite the first direction, at a third location at mid-length position on the bat.

91. The bat of claim 90 wherein the bat has a resistance to bending along the longitudinal axis in the range of 500-1500 lbs/in.

92. The bat of claim 90 wherein the handle member has a length in the range of 9 to 22 inches, and wherein the handle member has a weight in the range of 3 to 8 ounces.

93. The bat of claim 90, wherein the handle member has a weight in the range of 5 to 7 ounces.

94. The bat of claim 90, wherein the striking member is formed from a material selected from the group consisting of a metal, wood, a ceramic, and a fiber composite material.

95. The bat of claim 90, wherein the handle member is formed of a fiber composite material comprising a plurality of tubular layers, wherein each layer comprises a matrix including structural fibers supported by the matrix, and wherein the plurality of tubular layers includes fiber layer configurations selected from the group consisting a layer of longitudinally extending fibers, a layer of circumferentially extending fibers, a layer of helically extending fibers, a layer of braided fibers, and combinations thereof.

96. The bat of claim 95 wherein the handle member includes a proximal gripping portion and a distal tapered portion, wherein one of the proximal gripping portion and the distal tapered portion is formed with a larger number of layers than the remaining portion.

97. The bat of claim 90, wherein the composite material of the handle member comprises a chopped fiber slurry.

98. The bat of claim 90, further comprising a weighted plug coupled to the distal end of the handle member.

99. The bat of claim 98 wherein the weighted plug weighs in the range of 2 to 5 ounces.

100. The bat of claim 98 wherein the weighted plug has a length in the range of 1.0 to 4.0 inches.

101. The bat of claim 95 wherein the fibers have an area fiber density within the range of 0.0143 and 0.048 grams/cm^2.

102. The bat of claim 90, wherein the first material has a greater impact resistance to ball strikes than the composite material of the handle member.

103. The bat of claim 90, wherein at least one of an outer surface of the juncture section of the handle member and an inner surface of the junction section of the striking member has a plurality of projections which extend radially a predetermined distance.